

Claims

1. Data recording device comprising a two-dimensional array of microtips (3),
arranged in a plane facing a storage medium, and electronic means for
5 addressing and controlling the microtips so as to enable data recording on the
storage medium, device characterized in that the storage medium comprises a
flexible diaphragm (2) borne by a frame (1) forming a plurality of cells, at least
one micro-tip (3) being associated with each cell.
- 10 2. Device according to claim 1, characterized in that the microtips have an apex
of nanometric dimensions.
3. Device according to one of the claims 1 and 2, characterized in that the cells
are rectangular.
- 15 4. Device according to one of the claims 1 and 2, characterized in that the cells
are hexagonal.
5. Device according to any one of the claims 1 to 4, characterized in that it
20 comprises two arrays of microtips (3a, 3b) arranged on each side of the
storage medium.
6. Device according to claim 5, characterized in that the two arrays of microtips
are laterally offset so that the microtips (3a, 3b) associated with any one cell of
25 the frame (1) are not arranged exactly opposite one another.
7. Device according to any one of the claims 1 to 6, characterized in that the
frame (1) is formed by a silicon layer in which the cells are formed.

8. Device according to any one of the claims 1 to 7, characterized in that the flexible diaphragm (2) comprises at least a first layer (10), performing the function of a memory, and a second layer (6) designed to ensure a certain rigidity.

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9. Device according to claim 8, characterized in that the second layer (6) is an amorphous carbon or diamond-like carbon layer deposited on a silicon layer (7) before formation of the cells is performed on the opposite face of the silicon layer.

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10. Device according to claim 9, characterized in that the second layer (6) is doped by boron or silver.

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11. Device according to any one of the claims 1 to 10, characterized in that the flexible diaphragm comprises first (2a) and second (2b) elementary diaphragms separated by an array of spacer elements (12, 12a, 12b) laterally offset with respect to the frame (1).

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12. Device according to claim 11, characterized in that the array of spacer elements (12) constitutes an intermediate frame (12b).

13. Device according to claim 12, characterized in that the spacer elements are formed by studs (12a).

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14. Device according to any one of the claims 1 to 10, characterized in that it comprises an array of flexible plates (13), separated from the diaphragm (2) by a two-dimensional array of spacer studs (12a) and sub-dividing each cell into a plurality of elementary cells each associated with at least one microtip (3).

15. Device according to claim 14, characterized in that the number of microtips (3) of the array being about ten thousand, the number of elementary cells subdividing a cell is about one hundred.

5 **16.** Device according to one of the claims 14 and 15, characterized in that the array of microtips (3) has a slightly different pitch (P1) from that (P2) of the array of spacer studs (12a).

10 **17.** Device according to any one of the claims 14 to 16, characterized in that the frame (1) and plates (13) are formed in a silicon layer (14) having a thickness of 100 μ m to 500 μ m.

15 **18.** Device according to any one of the claims 11 to 17, characterized in that the spacer elements or studs (12, 12a, 12b) are made of silicon, silicon nitride or carbon, with a thickness of 50nm to 500nm.

19. Device according to any one of the claims 1 to 18, characterized in that it comprises means for relative movement of the storage medium and of the microtip array, in a direction parallel to said plane.